

copy protection is applied to the program and that, for example, the program can be recorded (picture-recorded) in an analog style but cannot be digitally recorded. Accordingly, the user is easily made aware of the copy protection features of the program before using or purchasing the program.

IN THE SPECIFICATION

CLEAN COPY OF AMENDED SPECIFICATION PARAGRAPHS:

[0005] Even if the digital data distributed by the digital broadcast are temporarily stored in a recording medium and copied into another recording medium many times, the image quality and the sound quality of the digital data do not deteriorate, and thus plural copies can be created. Such a situation is unfavorable from the viewpoint of copyrights, and thus distributed digital data are subjected to a method of preventing such illegal copies (copy protect).

[0009] As shown in the tables of Figs. 1 to 3, the specification on the copy protect is given so as to meet the type of content and the output destination. Of course, the user may become frustrated even when the user is directly supplied the information on the copy protect. However, when no information on the copy protect is supplied, the user may nevertheless be unable to record pictures because the copy protect is applied thereto although the user wants to record the pictures. There may occur a situation, therefore, in which the user cannot watch/listen to the pictures although the user paid to watch/listen to them.

[0015] Fig. 1 is a diagram showing the copy protect protocol for digital TV service;

[0016] Fig. 2 is a diagram showing the copy protect protocol for digital audio service;

[0017] Fig. 3 is a diagram showing the copy protect protocol for digital data service;

[0019] Fig. 5 is a flowchart showing the operation of the receiver of Fig. 4;

[0020] Fig. 6 is a continuation of the flowchart of Fig. 5;

[0021] Fig. 7 is a further continuation of the flowchart of Fig. 5;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0037] When the video encoder 14 outputs input video data to a television receiver 50, the video encoder 14 subjects the input video data to encode processing meeting the television receiver 50, for example, the encode processing based on the NTSC (National Television System Committee) system and then outputs the encoded data to the television receiver 50. The video data processed by the stream processor 13 are also output to a component 51 treating digital data.

[0041] The data corresponding to an instruction which the user transmits by using the remote controller 32 are received by a photodetector 18 of the receiver 10. The data received by the photodetector 18 or the data corresponding to the instruction based on the switch 33 are output to a display controller 19. The display controller 19 outputs the data from the photodetector 18, or the data from the switch 33, to a controller 20 if occasion demands, and also controls the display portion 21 according to the input data.

[0043] When a subscription for viewing a pay program is taken out, data supplied from a partner with which the subscription is taken out are stored in an IC card 31. This data is a descrambling key for descrambling the scramble or the like. The IC card 31 is mounted in a card I/F (Interface) 22 so that the recorded data are read out. The data thus read out are output to the controller 20.

[0045] The operation of the receiver 10 when the user tunes a program will be described with reference to the flowcharts of Figs. 5 to 7. In step S1, the tuning by user is started. The user can select a desired program (channel) by the remote controller 32 or the switch 33. In step S2, it is judged whether the program selected by the user can be watched/listened to.

[0050] On the other hand, if it is judged in step S3 that the IC card 31 can be accessed, the processing goes to step S5 to

judge whether a selected program has a restriction on the age for watching or listening to the program. If it is judged that the program has an age restriction, the display is switched to a frame for input of a code number in step S6, and the program is set to a code-number input standby state.

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[0052] On the other hand, if it is judged in step S5 that no age restriction is imposed, the processing of step S6 is skipped, and the processing goes to step S7. It is judged in step S7 whether the selected program is a program to be purchased or not. A program for which it is judged unnecessary to purchase is a charge-free broadcast program or a program for which it is judged that a subscription for the program was taken out in advance.

[0053] If it is judged in step S7 that the program selected by the user is a program which need not be purchased, in other words, the program can be watched/listened to, the tuning processing is finished and the screen of the television receiver 50 is switched to display the program selected. On the other hand, if it is judged in step S7 that the program selected by the user is a program which must be purchased, the processing goes to step S8 (Fig. 6).

[0054] It is judged in step S8 whether the time for purchasing the program selected by the user has expired. For example, if the broadcast time for the program selected by the user has terminated, it is judged that the purchase time has passed. If it is judged in step S8 that the purchase time for the program has passed, the processing goes to step S9.

[0057] The processing of the step S12 and the subsequent steps is carried out according to the content described in such a descriptor. It is judged in step S12 whether the copy control type is equal to 01 or not. If the copy control type is equal to 01, some restriction exists on copying the program as is apparent from Fig. 1 to Fig. 3. If it is judged in step S12 that the copy control type is not equal to 01, the processing goes to step S13.

[0062] Further, if it is judged in step S13 that the service type is not television and it is judged in step S14 that the

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control type is not equal to 11, the processing goes to step S15 to judge whether television receiver 50 is of the type in which the receiver 10 is installed. The above processing procedure is carried out because only sounds can be supplied from the television receiver 50 to a user when the service type is not television, for example when the service type is radio.

[0063] If it is judged in step S15 that the receiver 10 is not a built-in receiver, in other words, if it is judged that the receiver 10 and the television receiver 50 are connected to each other with an external terminal through a cable or the like, the processing goes to step S16 in which a message to make the user recognize that the program is a program which the user cannot watch/listen to as shown in Fig. 9 is displayed on the screen of the television receiver 50.

[0065] If it is judged in step S12 that the copy control type is equal to 01, or it is judged in step S14 that the control type is equal to 11, the processing goes to step S17. The case where the control type is equal to 01 and the case where the control type is equal to 11 show that some restriction is imposed on copying the program.

[0066] It is judged in step S17 whether CGMS (digital recording control data) is equal to 00. As is apparent from Fig. 1 to Fig. 3, four flags of 00, 10, 01 and 11 are used for the digital recording control data (CGMS) for designating all the various control types. When CGMS is equal to 00, it shows that copying is allowed.

[0067] If it is judged in step S17 that CGMS is not equal to 00, the processing goes to step S18 to judge if CGMS is equal to 10. If CGMS is equal to 10, it shows that only one copy is allowed. If it is judged in step S18 that CGMS is not equal to 10, the processing goes to step S19 to judge whether APS (Analog Protection System) is equal to 00.

[0069] In step S21, a display frame as shown in Fig. 11 is displayed on the television receiver 50. When such a display frame is displayed, it shows that copying is allowed if it is

analog. When the processing of step S20 or step S21 is finished, the processing goes to step S22, and in step S22 it is judged whether a "cancel" button in the display frame shown in Fig. 10 or Fig. 11 is operated. If it is judged in step S22 that the "cancel" button is operated, the tuning processing is finished.

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[0071] On the other hand, if it is judged in step S18 that CGMS is equal to 10, the processing goes to step S23 to judge whether an additional fee is needed. If it is judged that CGMS is equal to 10, as is apparent from Fig. 1 to Fig. 3, copying is allowed. It is judged in step S23 whether an additional fee is needed for copying (recording), particularly whether an additional fee is needed to analog copy. If it is judged in step S23 that no additional fee is needed, the processing goes to step S26 (Fig. 7). The processing also goes to step S26 if it is judged in step S17 that CGMS is equal to 00 (when it is judged that copying is free).

[0072] On the other hand, if it is judged in step S23 that an additional fee is needed, the processing goes to step S24 to display to the user that an additional fee is needed for recording, as shown in Fig. 12 (in the example of Fig. 12, a yen mark (¥) is displayed on a "recording" button). As shown in Fig. 12, the additional fee for recording is displayed.

[0073] On the display frame as shown in Fig. 12, it is judged in step S25 whether the user operates the "cancel" button. If it is judged in step S25 that the "cancel" button is operated, the processing of the tuning is finished. If it is judged in step S25 that the "cancel" button is not operated, in other words, if it is judged that the "only watching/listening" button or the "recording" button is operated, the processing goes to step S26.

[0076] A "purchase" button and a "purchase cancel" button are provided in the lower portion of the screen. When selected ESs need additional fees, the total amount of the additional fees is displayed between these buttons. The user selects a desired ES using such a display frame, and operates the "purchase" or "purchase cancel" buttons.

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[0080] On the other hand, if it is judged in step S31 that the program which the user decides to purchase is within the purchase time, the processing goes to step S32 to judge whether descrambling can be performed. If it is judged in step S32 that descrambling cannot be performed, for example, because of some restriction, a display to make the user recognize this fact is provided in step S33. In step S33, such a display frame as shown in Fig. 15 or Fig. 16 is displayed on the television receiver 50.

[0081] In the display example shown in Fig. 15, the program which the user decides to purchase is a program having a restriction to a watching/listening district, and it is a display frame when the user does not live in the district in which watching/listening is permitted. The display example of Fig. 16 is a display frame displayed when the watching/listening (purchasing) is not allowed under a subscription condition such as where the program which the user decides to purchase belongs to a channel to which the user does not subscribe, the program is a program for which the user does not subscribe, or the like. When such a display frame is displayed, the tuning processing is finished.

[0083] In step S35, a message is displayed on the television receiver 50 to the user that the program which he or she wishes to purchase cannot be purchased because the program's cost exceeds the upper limit of the user's payment card as shown in Fig. 17, and the tuning processing is finished. On the other hand, if it is judged in step S34 that the program does not exceed the upper limit of the payment card, the processing goes to step S36, and a preview of the purchased program is displayed for only a predetermined time (for example, 3 seconds) as shown in Fig. 18. Further, a message indicating that the procedure for the purchase has been completed is also displayed.

[0084] The program desired by the user is selected as described above. As described above, the copy protect is determined in accordance with the service type and the device which is the output destination of the received data. Therefore,

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according to the above processing, the user can easily purchase a desired program without suffering cumbersome complicated stipulations on the copy protect, and also the user does not suffer the disadvantage of being unable to make a recording because of the application of copy-protect and thus be able to only watch/listen to a program after the user purchases the program.

[0086] A series of processing steps as described above can be implemented using hardware or software. When the series of processing steps is implemented using software, the program constituting the software is installed from a recording medium into a special-purpose computer or a general purpose computer which can perform various functions by installing various programs therein.

[0087] As shown in Fig. 19, this recording medium can be constructed not only as a package medium comprising a magnetic disc 121 (containing a floppy disk), an optical disc 122 (containing CD-ROM (Compact Disc-Read Only Memory)), DVD (Digital Versatile Disk)), a magnetooptical disc 123 (containing MD (Mini-Disk)), a semiconductor memory 124 or the like that has the program recorded therein and is distributed to supply the program to users separately from a computer, but also as a hard disc containing ROM 102 or a storage portion 108 that has the program recorded therein and is supplied to users under the state that it is installed in a computer in advance.

[0088] In this specification, the step describing the program to be supplied through the medium contains not only the processing that is carried out in a sequential series according to the described order, but also the processing that is not carried out in this order, but in parallel to, or independent of this processing.

IN THE CLAIMS

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2. (AMENDED) The information processing device as claimed in claim 1, wherein in accordance with each of a case